



GROUNDWATER MONITORING REPORT DECEMBER 2010

PHILLIPS L30-6JI

On November 4, 2010, LT Environmental, Inc. (LTE) conducted groundwater sampling on behalf of Noble Energy, Inc., at the Phillips L30-6JI Tank Battery (Site). This sampling event constitutes the sixth post remediation monitoring event at the Site. Site history, remediation activities, and groundwater monitoring results have been described in preceding reports.

Groundwater level measurements collected are summarized in Table 1. Monitoring wells SB06, SB08, SB10, SB12, and SB13 were installed on May 21, 2009, monitoring wells SB18 and SB19 were installed on May 26, 2009. Monitoring well SB06 was destroyed prior to the November 20, 2009 sampling event and was reinstalled January 15, 2010 as SB06R. Well locations, surface features, and current benzene concentrations are presented in Figure 1.

Depth to groundwater ranged from 1.80 feet below top of casing (btoc) in SB19 to 3.27 feet btoc in SB12 and was used to calculate well-specific purge volumes. Following purging, groundwater samples were submitted to Origins Laboratory, Inc. of Denver, Colorado for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency Method 8260B.

Groundwater analytical results, presented in Table 1, indicate BTEX concentrations are in compliance with the Colorado Department of Public Health and Environment Water Quality Control Commission Regulation 41 (WQCC Reg 41). The laboratory analytical report is included as an Appendix.

LTE will continue to conduct quarterly groundwater monitoring events with the goal of observing four consecutive quarters of analytical results in compliance with applicable regulatory standards. The next quarterly groundwater sampling event is scheduled for February 2011.

TABLE

TABLE 1

GROUNDWATER ANALYTICAL DATA
PHILLIPS L30-6JI
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.

MONITORING		DEPTH TO WATER	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
WELL	DATE	(feet btoc)	(µg/l)	(µg/l)	(µg/l)	(µg/l)
SB06	5/29/2009	3.53	<1.00	9.71	20.5	30.81
	8/4/2009	2.03	33.7	<1.00	33.4	231.6
	11/20/2009	Destroyed				
SB06R	2/18/2010	3.78	<1.00	<1.00	<1.00	<3.00
	5/19/2010	3.43	<1.00	<1.00	<1.00	<1.00
	8/4/2010	2.6	<1.00	<1.00	<1.00	<1.00
	11/4/2010	3.16	<1.00	<1.00	<1.00	<1.00
SB10	5/29/2009	2.77	<1.00	<1.00	<1.00	<3.00
	8/4/2009	2.37	2.35	<1.00	9.88	89.5
	11/20/2009	2.79	<1.00	<1.00	<1.00	<3.00
	2/18/2010	3.22	<1.00	<1.00	<1.00	<3.00
	5/19/2010	2.82	<1.00	<1.00	<1.00	<1.00
	8/4/2010	2.09	<1.00	<1.00	<1.00	<1.00
	11/4/2010	2.59	<1.00	<1.00	<1.00	<1.00
SB12	5/29/2009	3.46	103	281	69.2	861
	8/4/2009	2.75	130	31.4	15.3	174.6
	11/20/2009	3.47	3.71	62.3	12.8	115.4
	2/18/2010	3.93	3.29	<1.00	37.4	279.0
	5/19/2010	3.49	1.87	2.20	57.6	442
	8/4/2010	2.72	3.79	7.90	8.57	64
	11/4/2010	3.27	2.71	231.00	49.2	589
SB13	5/29/2009	3.1	<1.00	<1.00	<1.00	<3.00
	8/4/2009	2.39	<1.00	<1.00	<1.00	<3.00
	11/20/2009	3.11	<1.00	<1.00	<1.00	<3.00
	2/18/2010	3.60	<1.00	<1.00	<1.00	<3.00
	5/19/2010	3.19	<1.00	<1.00	<1.00	<1.00
	8/4/2010	2.35	<1.00	<1.00	<1.00	<1.00
	11/4/2010	2.91	<1.00	<1.00	<1.00	<1.00
SB18	5/29/2009	3.06	2.52	<1.00	<1.00	<3.00
	8/4/2009	2.4	<1.00	<1.00	<1.00	<3.00
	11/20/2009	3.10	<1.00	<1.00	<1.00	<3.00
	2/18/2010	3.55	<1.00	<1.00	<1.00	<3.00
	5/19/2010	3.14	<1.00	<1.00	<1.00	<1.00
	8/4/2010	2.34	<1.00	<1.00	<1.00	<1.00
	11/4/2010	2.91	<1.00	<1.00	<1.00	<1.00
SB19	5/29/2009	2.97	17.1	<1.00	<1.00	<3.00
	8/4/2009	2.34	<1.00	<1.00	<1.00	<3.00
	11/20/2009	2.02	<1.00	<1.00	<1.00	<3.00
	2/18/2010	2.51	58.5	<1.00	18.68	<3.00
	5/19/2010	2.06	54.8	<1.00	<1.00	67.1
	8/4/2010	1.23	<1.00	<1.00	<1.00	<1.00
	11/4/2010	1.8	<1.00	<1.00	<1.00	<1.00
CDPHE WQCC Reg 41			5.0	560	700	1,400

NOTES:

btoc - below top of casing

µg/l - micrograms per liter

< - indicates result is less than the stated laboratory reporting limit

Bold - indicates concentration exceeds the CDPHE WQCC Reg 41 standard

CDPHE WQCC Reg 41 - Colorado Department of Public Health and Environment - Water Quality Control

Commission Regulation 41 covering Basic Standards for Groundwater

Benzene, toluene, ethylbenzene, total xylenes analyzed by EPA Method 8260B



FIGURE



IMAGE COURTESY OF GOOGLE EARTH, 2009

LEGEND

- PRODUCTION WELLHEAD
- ⊗ MONITORING WELL
- PERMEABLE REACTIVE BARRIER (PRB)
- EXCAVATION EXTENT

GROUNDWATER SAMPLES WERE
COLLECTED ON NOVEMBER 4, 2010

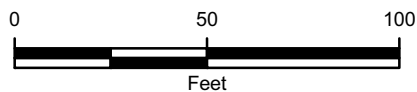


FIGURE 1
BENZENE CONCENTRATION IN GROUNDWATER
PHILLIPS L30-6JI
SEC30 - 3N - 66W
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.



APPENDIX
ANALYTICAL REPORT



November 09, 2010

LT Environmental, Inc.

Matthew Harrison

4600 West 60th Avenue

Arvada

CO

80003

Project Name- Noble - Phillips L30-6JI

Project Number- NEP0909

Attached are your analytical results for Noble - Phillips L30-6JI received by Origins Laboratory, Inc. November 4, 2010 3:25 pm. This project is associated with Origins project number X011039-01 .

The analytical results in the following report were analyzed under the guidelines of EPA Methods specified in SW-846. The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
SB10	X011039-01	Water	11/4/2010 11:05:00AM	11/04/2010 15:25
SB12	X011039-02	Water	11/4/2010 11:35:00AM	11/04/2010 15:25
SB13	X011039-03	Water	11/4/2010 11:25:00AM	11/04/2010 15:25
SB18	X011039-04	Water	11/4/2010 10:55:00AM	11/04/2010 15:25
SB19	X011039-05	Water	11/4/2010 11:15:00AM	11/04/2010 15:25
SB06-R	X011039-06	Water	11/4/2010 10:45:00AM	11/04/2010 15:25

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Noelle E Doyle,

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

www.originslaboratory.com

X011039

page 1 of 1

Client: LT
Address: 4600 West 60th Ave
Telephone Number: 303 433 9788
Email Address: mharrison@ltlab.com

Project Manager: MATT HARRISON
Project Name: Phillips L30-6JI
Project Number: NEP0909
Samples Collected By: BILLY FOLKNER

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa Canister #		
SB 10	11/4/10	1105	3	X				X				1
SB 12		1135	3	X				X				2
SB 13		1125	3	X				X				3
SB 18		1055	3	X				X				4
SB 19		1115	3	X				X				5
SB 26 R	11/4/10	1045	3	X				X				6
												7
												8
												9
												10

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:
Bth	11/4/10	1325				Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input checked="" type="checkbox"/>
				11/4/10	1525	Standard <input type="checkbox"/>

1725 Elk Place | Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Origins Laboratory, Inc.

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Noelle E Doyle,

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6Jl

SB10

11/4/2010 11:05:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X011039-01 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	OK05004	11/05/2010	11/06/2010	
Toluene	ND	1.00	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	
Xylenes, total	ND	1.00	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	123 %	73.5-130	"	"	"	"	"	
Surrogate: Toluene-d8	109 %	79.3-113	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	81.5-117	"	"	"	"	"	

Origins Laboratory, Inc.



Noelle E Doyle,

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

SB12

11/4/2010 11:35:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
XO11039-02 (Water)

BTEX by EPA 8260B

Benzene	2.71	1.00	ug/L	1	OK05004	11/05/2010	11/06/2010	
Toluene	231	10.0	"	10	"	"	11/08/2010	
Ethylbenzene	49.2	1.00	"	1	"	"	11/06/2010	
Xylenes, total	589	10.0	"	10	"	"	11/08/2010	

Surrogate: 1,2-Dichloroethane-d4	109 %	73.5-130	"	"	11/06/2010	
Surrogate: Toluene-d8	91.6 %	79.3-113	"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	81.5-117	"	"	"	

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

SB13

11/4/2010 11:25:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
XO11039-03 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	OK05004	11/05/2010	11/06/2010	
Toluene	ND	1.00	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	
Xylenes, total	ND	1.00	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	108 %	73.5-130			"	"	"	
Surrogate: Toluene-d8	91.8 %	79.3-113			"	"	"	
Surrogate: 4-Bromofluorobenzene	104 %	81.5-117			"	"	"	

Origins Laboratory, Inc.



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Noelle E Doyle,

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6Jl

SB18

11/4/2010 10:55:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X011039-04 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	OK05004	11/05/2010	11/06/2010
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
Xylenes, total	ND	1.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	99.5 %	73.5-130	"	"	"
Surrogate: Toluene-d8	102 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	81.5-117	"	"	"

Origins Laboratory, Inc.



Noelle E Doyle,

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6Jl

SB19

11/4/2010 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X011039-05 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	OK05004	11/05/2010	11/06/2010	
Toluene	ND	1.00	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	
Xylenes, total	ND	1.00	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	107 %	73.5-130	"	"	"
Surrogate: Toluene-d8	90.8 %	79.3-113	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	81.5-117	"	"	"

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6Jl

SB06-R

11/4/2010 10:45:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X011039-06 (Water)

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	OK05004	11/05/2010	11/06/2010	
Toluene	ND	1.00	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	
Xylenes, total	ND	1.00	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	100 %	73.5-130	"	"	"	"	"	
Surrogate: Toluene-d8	104 %	79.3-113	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	81.5-117	"	"	"	"	"	

Origins Laboratory, Inc.



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Arvada CO 80003

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6Jl

Volatile Organic Compounds by EPA Method 8260B - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch OK05004 - EPA 5030B										
Blank (OK05004-BLK1)					Prepared: 11/05/2010 Analyzed: 11/05/2010					
Benzene	ND	1.00	ug/L							
Toluene	ND	1.00	"							
Ethylbenzene	ND	1.00	"							
m,p-Xylene	ND	2.00	"							
o-Xylene	ND	1.00	"							
Surrogate: 1,2-Dichloroethane-d4	65.9		"	62.5		105	73.5-130			
Surrogate: Toluene-d8	59.4		"	62.5		95.1	79.3-113			
Surrogate: 4-Bromofluorobenzene	64.8		"	62.5		104	81.5-117			
LCS (OK05004-BS1)					Prepared: 11/05/2010 Analyzed: 11/05/2010					
Benzene	52.5	1.00	ug/L	50.0		105	77.3-128			
Toluene	50.3	1.00	"	50.0		101	81.7-118			
Surrogate: 1,2-Dichloroethane-d4	67.2		"	62.5		107	73.5-130			
Surrogate: Toluene-d8	57.8		"	62.5		92.5	79.3-113			
Surrogate: 4-Bromofluorobenzene	64.5		"	62.5		103	81.5-117			
Matrix Spike (OK05004-MS1)					Source: X011038-01	Prepared: 11/05/2010 Analyzed: 11/05/2010				
Benzene	54.2	1.00	ug/L	50.0	ND	108	74.5-132			
Toluene	51.9	1.00	"	50.0	ND	104	74.2-116			
Surrogate: 1,2-Dichloroethane-d4	66.1		"	62.5		106	73.5-130			
Surrogate: Toluene-d8	57.6		"	62.5		92.1	79.3-113			
Surrogate: 4-Bromofluorobenzene	64.0		"	62.5		102	81.5-117			
Matrix Spike Dup (OK05004-MSD1)					Source: X011038-01	Prepared: 11/05/2010 Analyzed: 11/05/2010				
Benzene	54.1	1.00	ug/L	50.0	ND	108	74.5-132	0.185	13.1	
Toluene	52.5	1.00	"	50.0	ND	105	74.2-116	1.19	21.2	
Surrogate: 1,2-Dichloroethane-d4	66.8		"	62.5		107	73.5-130			
Surrogate: Toluene-d8	58.0		"	62.5		92.8	79.3-113			
Surrogate: 4-Bromofluorobenzene	64.0		"	62.5		102	81.5-117			

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Matthew Harrison
Project Number: NEP0909
Project: Noble - Phillips L30-6JI

Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit
RPD Relative Percent Difference

Origins Laboratory, Inc.



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